

By F. MONRÓS

## INTRODUCTION

Since Crowson's revision of *Aulacoseclis* in 1946, several changes have been introduced in the group, so that it seems time to study it again.

I have undertaken the present revision because I have been able to examine all the described species (76% of them on the basis of type specimens) and also because it seems worth while to make a more detailed study of a group of Chrysomelidae which, from a theoretical point of view, figures among the most interesting of the whole family.

## MATERIAL STUDIED AND ACKNOWLEDGEMENTS

An alphabetical list of the collections examined follows, with the abbreviations used in the text and the names of the entomologists who made the examination possible, to all of whom I want to express my best thanks.

California Academy of Sciences, San Francisco (CAS) — Mr. H. B. Leech.

Carnegie Museum, Pittsburgh (CM) — Dr. G. Wallace.

Chicago Museum of Natural History (CMNH) — Mr. R. L. Wenzel.

Cornell University, Ithaca (CU) — Dr. H. Dietrich.

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Philadelphia Academy of Sciences (PAS) — Dr. A. G. Rehn.

United States National Museum, Washington (USNM) — Dr. E. Chapin.

Wilcox collection, Albany, N. Y. (W) — Dr. J. C. Wilcox.

I also want to thank the John Simon Guggenheim Memorial Foundation for making it possible to study the chrysomelid collections in the United States, and also to collect in the southwestern states, and to make some observations on living *Aulacoseclis*.

Finally, I want to express my gratitude to the following persons, who contributed in different ways to make the present revision possible:

Dr. W. H. Anderson, U. S. Dept. of Agriculture, Washington, for some specimens of *Aulacoseclinae* intercepted at the Mexican border.

Dr. E. B. Britton, British Museum of Natural History, London, for sending paratypes of *Aulacoscelis melyroides* Crowson, at my request.

Dr. P. J. Darlington, Cambridge, for kindly reading the manuscript and correcting the language, as well as for the facilities given at all times.

As for the collections in the Museum of Comparative Zoology, the following remark seems necessary: Most of the Aulacoscelinae studied are in the Bowditch collection, which is based mostly on Jacoby's material. Some of the specimens which have been used by Jacoby in the *Biologia Centrali Americana* and are now in the Bowditch collection have a "type" label, while specimens of the same species in the British Museum also studied by Jacoby have been regarded as "types" by Crowson. As it seems difficult and almost useless to establish which of these specimens must be considered as the holotypes, I regard all the specimens used in the *Biologia Centrali Americana* which fit Jacoby's original descriptions and localities as cotypes, regardless of the collection in which they are now deposited.

## HISTORY

1842. Duponchel and Chevrolat briefly described the genus *Aulacoscelis* and the species *melanocera* which they considered close to *Phyllocara* (Chrysomelinae). The genus and species were credited to Chevrolat in Dejean's catalogue, 1837, but the reference cannot be taken into account, as in that catalogue both terms are *nomina nuda*.
1865. Without referring to the previous description by Duponchel and Chevrolat, Stål described *Aulacoscelis melanocera* which he placed among the Chrysomelinae, without analyzing its relationship.
1874. Chapuis created the tribe Aulacoscelini (Aulacoscérites in Chapuis), and transferred the genus *Aulacoscelis* from the Chrysomelinae to the Sagrinae; he described a second species from Guatemala.
1874. Gemminger and Harold listed the known species of *Aulacoscelis* as Sagrinae.
- 1877, 1880 and 1888. Jacoby described and illustrated several species and listed the *Aulacoscelis* known to occur in Central America. He placed the genus in the Sagrinae, without further analysis.
1892. Horn described *Aulacoscelis purpurea*, from southwestern United States.

1903. In the revision of the genera of Sagrinae for Wytsman's *Genera Insectorum*, Jacoby excluded *Aulacoscelis* which he referred to the Chrysomelinae.
1913. Clavareau listed the known species of *Aulacoscelis*, numbering 12. He placed the genus in the tribe Aulacoscelini at the end of the Sagrinae. In the more recent catalogues (Leng, 1920 and supplements; Blackwelder, 1946), *Aulacoscelis* has also been included in the Sagrinae.
1933. Schaeffer described *Aulacoscelis ventralis*, from Arizona.
1941. Maulik briefly stated that *Aulacoscelis* cannot be considered as belonging to the Sagrinae.
1946. Crowson published a careful revision of the genus which he placed in a special tribe in the Sagrinae. It is to be noted that in this paper the Sagrinae had a broad sense, including *Orsodacna* and related genera, now split into as many as three different subfamilies (*Orsodacninae*, *Zeugophorinae* and *Synetinae*), and the tribe Horniini, which is now considered to be a tribe of primitive Eumolpinae. In the key to species, Crowson omitted *A. melanocephala* and wrongly credited *A. melanocera* to Jacoby.
1949. Monrós excluded Aulacoscelini from the Sagrinae and suggested a position among the primitive Eumolpinae.
1950. Bechyně described *A. costaricensis*, from Costa Rica.
1953. Monrós described the new genus *Janbechynea* from Bolivia and defined the new subfamily Aulacoscelinae, which he considered close to Chrysomelinae.

## PUBLISHED ILLUSTRATIONS AND MORPHOLOGICAL DATA ON AULACOSCELINAE

General habitus illustrations of the following species have been published in color:

- Aulacoscelis candezei* (Chapuis, 1874, pl. 111, f. 6; Jacoby, 1888, pl. 35, f. 7).  
*A. confusa* (Jacoby, 1888, pl. 35, f. 6).  
*A. sanguinea* (Jacoby, 1888, pl. 35, f. 10).  
*A. melanocephala* (Jacoby, 1880, pl. 1, f. 1).  
*A. variabilis* (Jacoby, 1888, pl. 35, f. 8, 9).  
*A. tibialis* (Jacoby, 1888, pl. 35, f. 2).  
*A. grandis* (Jacoby, 1888, pl. 35, f. 1).  
*Janbechynea fulvipes* (Jacoby, 1888, pl. 35, f. 3, 4).  
*J. elongata* (Jacoby, 1888, pl. 35, f. 5).

The following species have also been illustrated:

- Aulacoscelis melanocera* (Monrós, 1949, f. 22).  
*Janbechynea paradoxa* (Monrós, 1953, f. 1, 2).

Also the following parts have been described and figured :  
Labium and maxilla of *Aulacoseelis candezei* (Chapuis, 1874, pl. 111, f. 6a, 6b) ; labium of *A. melanocera* (Monrós, 1949, f. 6) and buccal pieces of *Janbechynea paradoxa* (Monrós, 1953, f. 3-6).  
Ventral thoracic morphology of *Aulacoscelis högei* (Crowson, 1946, f. 26) and lateral prothoracic of *A. melanocera* (Monrós, 1949, f. 9).  
Wing venation of *Aulacoscelis högei* (Crowson, 1946, f. 13), *A. melanocera* (Monrós, 1949, f. 14), and *Janbechynea paradoxa* (Monrós, 1953, f. 8).  
Tarsi of *Janbechynea paradoxa* (Monrós, 1953, f. 7).  
Metendosternite of *Aulacoscelis högei* (Crowson, 1946, f. 23).  
Male genitalia of *Aulacoscelis melanocera* (Monrós, 1949, f. 21).

As can be seen, 70 per cent of all the known forms of the group have been illustrated, which is much more than the average in the Chrysomelidae. The morphology of the Aulacoscelinae is also one of the best known of the entire Chrysomelidae. In spite of these facts, however, their systematic position has been much confused.

#### CHARACTERS OF SUBFAMILY AULACOSCELINAE

Of elongate and more or less parallel shape ; ventrally pubescent. Head not concealed under thorax, pro- or orthognathous. Clypeus separated from interocular space by a distinct transverse depression. Eyes rounded, entire, moderately projecting, not touching anterior margin of prothorax. Antennae inserted on sides of head, between eyes and base of mandibles, separated by entire width of frons and not able to be concealed under ventral surface, subfiliform to slightly serrate, nearly as long as or little longer than one half the body length. Palpi not truncate at apex. Ligula semimembranous and distinctly bilobed. Dorsal surface of head without deep interantennal crossed sulci.

Prothorax narrower than base of elytra, with distinct and entire lateral margins and evident angles, all without sensorial setae. Prosternum narrow but visible between procoxae, the latter projecting and transverse ; procoxal cavities closed behind.

Mesosternum advanced between mesocoxae which are moderately separated. Metendosternite as shown in Figure 53.

Elytra longer than abdomen, rather soft and often with carinae or tubercles, slightly to moderately dehiscant at apex and without regular rows of punctures.

Wing venation of the Chrysomelinae-type, without cells between M3 and CuII.

Femora not dilated and without teeth. Tibiae with two small but distinct apical spurs on inner edge. Tarsi without empodium, third segment slightly bilobed; claws simple, equal and divergent.

Abdomen with five visible sternites, the last with sexual differences.

Male genitalia with tegmen forming a ring prolonged ventrally in a long median process and entire dorsally, and with lateral lobes articulate; median lobe with two long basal median struts under which the internal sac is protected.

### SYSTEMATIC POSITION

The combination of characters just described easily distinguishes the Aulacoscelinae from the remaining Chrysomelidae. It is not easy, however, to establish its relationship, as the group presents a misleading mixture of characters which conceal its real affinities.

The bilobed ligula appears only in the primitive Chrysomelidae as a character which they retain in common with the Cerambycidae. The Aulacoscelinae need thus to be differentiated only from the other Chrysomelidae with bilobed ligula, from all of which they are easily distinguished by the pronotum with entire and distinct lateral margins. From the Bruchidae, also with bilobed ligula and undoubtedly related to the Chrysomelidae, the Aulacoscelinae differ by the non-pedunculate mentum and their entirely different shape, as well as probably a different biology. From the Cerambycidae too, they may be easily distinguished by the cephalic and ocular morphology and antennal insertion, as well as probably by different larval biology.

From the other Chrysomelidae with bilobed ligula, the Aulacoscelinae may be distinguished not only by the prothoracic structure but also in different cases as follows: From the Sagrinae by absence of cephalic sulci, simple hind femora, and tibiae with apical spurs. From the Orsodaeninae (including the subfamilies Zeugophorinae and Synetinae, of dubious significance), by the simple claws. From Megalopinae, by the antennal shape, non-constricted sternites, tarsi without empodium.

The only significant character which the Chrysomelidae with bilobed ligula seem to have in common is the bilobed ligula itself, and each of the subfamilies which possesses it seems to represent

a different phylogenetic line, so that they can hardly be grouped together in one section, as is customarily done, under the name of Eupoda. The section Eupoda seems to cut across the true relationships of the chrysomelids, and so appears to be of no use. The term may be retained to designate the group formed by Sagrinae, Donaciinae and Criocerinae, which represent one evolutionary line.

Except for the Hispinae and Cassidinae, of which the connections with the rest of the Chrysomelidae are not yet known and which should perhaps be considered as forming a separate family, comparable in distinctness to the Bruchidae or the Cerambycidae, all the more specialized groups of Chrysomelidae seem to have retained some primitive members represented by the forms with bilobed ligula. Thus, the Sagrinae may be placed at the base of the line leading to the Criocerinae and the Donaciinae; the Megalopinae, at the beginning of the line of *Camptosoma*, in spite of the different larval habits and several other minor differences which make the relationship not very close; *Orsodacna* and allied genera (whether or not they are considered to form different subfamilies and excluding the Zeugophorinae which seem to be no more than a tribe of the Megalopinae) at the beginning of the line of Eumolpinae, and the Aulacoscelinae, at the beginning of the line of the Chrysomelinae and Alticinae-Galerucinae.

This does not mean that the Aulacoscelinae can be considered as direct ancestors of the Chrysomelinae, nor that the center of origin of this section can be placed in Central America, but simply that the tendency which culminates in the more specialized Chrysomelinae or the still more specialized Alticinae-Galerucinae is already present in the Aulacoscelinae. The latter must be considered as a relict and one which may illustrate the probable general appearance of primitive Chrysomelidae.

In connection with that point of view, the genera of the Chrysomelinae need to be rearranged and *Timarcha*, with a male genital structure closely resembling that of the Aulacoscelinae, must be placed at the beginning of the Chrysomelinae; the order of the remaining genera must be reversed so that the more specialized Doryphorini are considered at the end, and not at the beginning of the Chrysomelinae.

Each one of the lines analyzed represents a natural unit and

may be identified by a name. The term *Cyclica* may be applied to the phylogenetic line represented by Aulacoscelinae-Chrysomelinae and Alticinae-Galerucinae, and there seems to be no good reason to subdivide it into *Cyclica s. str.* and *Trichostoma* as is frequently done.

## GEOGRAPHIC DISTRIBUTION

(Figures 2, 3)

The Aulacoscelinae are restricted to the Western Hemisphere. The Central American mainland has most species, and two species of *Janbechynea* are found as far south as Peru and Bolivia; the same genus (subgenus *Bothrosclis*) has extended north to the southwestern United States, where also the genus *Aulacoscelis* is known to occur. The North American specimens of *Aulacoscelinae* are the extreme northern representatives of species which have their center farther south. As for *Aulacoscelis högei*, reported by Jacoby from Vancouver Island in western Canada, it is probably an error of labeling.

The subfamily is absent in the Caribbean Islands and in Florida, in spite of the fact that it is found at equivalent latitudes on the Central American mainland.

## BIOLOGY AND ECOLOGY

According to the labels which accompany some of the specimens studied, the host plants of adult Aulacoscelinae are the following:

*Aulacoscelis candezei*, flowers of Compositae in New Mexico (Monrós).

*A. melanocera*, *Cycas revoluta* in Mexico and El Salvador; "Palm" in Honduras (this could also refer to Cycadaceae, commonly known as "sago palms") (Specimens in USNM).

*A. costaricensis*, leaves of *Cycas revoluta* in Costa Rica (Specimens collected by Nevermann in USNM).

*Janbechynea elongata*, cycads in Mexico, with the remark "infestation heavy." (Specimens intercepted at Laredo, now in USNM.)

In the United States National Museum collection there are some unidentified specimens of *Aulacoscelis* from the Rio Grande area in southern Texas collected by G. Vogt on flowers of *Hechtea texensis* (Bromeliaceae); their specific identity has not been established.

Nothing is known of the host plants of the remaining species, and no larva has yet been collected.

It is worthy of note that the Aulacoscelinae are absent from Florida and the West Indies, even though *Zamia* and other cycads are known from these areas. In the case of the South American species of *Janbechynea* the host plant association is not established, but the coincidence of their ranges with those of Cycadaceae in South America is perhaps suggestive.

*Aulacoscelis* seem to prefer semi-arid regions and in spite of some exceptions, for instance *A. costaricensis* and *A. melanocera* found in tropical rain-forest, most of the species occur where semi-arid conditions prevail. Although little is known of the ecological limitations of the subfamily, the species seem to have rather wide ranges and to occur under several and sometimes quite opposite environmental conditions. This is true not only of the different species but also in some cases of single species as, for instance, *A. melanocera*, collected on the high plateaus of central Mexico as well as in the limestone country of north Yucatan and in the tropical rain-forest of the Canal Zone.

As to their habitats, some species seem to be not uncommon, and *A. melanocera* or *A. candezei* are not rare in the collections; the majority of the species, however, are known only from the type specimens or typical series, and too little is known of their biology to allow general conclusions to be reached.

The fact that *A. melanocera* and *A. costaricensis* are reported feeding on the introduced *Cycas revoluta* seems to point out some degree of plasticity in the feeding habits.

I have collected one specimen of *A. candezei* in Isleta (Pueblo Indian Reservation in New Mexico, not far from Albuquerque). The area is a dry one, highly modified by irrigation and cultivation. The only specimen collected was found on the flowers of an unidentified Compositae and its behavior was similar to that of an adult *Orsodacna*. It was collected at about 11 A.M. on June 14, 1953. This specimen was not very active but tried to fly away and to bite with its mandibles in an attempt to escape. Several mutilated specimens of *Janbechynea elongata* in a vial, intercepted at Laredo, also show signs of using their mandibles when excited.

*Aulacoscelis candezei* does not stridulate nor jump and the



color of the living specimen is almost the same as that of the specimens in the collections.

I have studied some specimens of *Aulacoscelis högei* in Cornell University collections with the label "at light."

### VARIABILITY

Although the samples studied are too small to show the infra-specific variability of the Aulacoscelinae, in the cases in which I have seen enough material, some color variability has been observed, culminating in *Aulacoscelis candezei*, in which there are both totally brick-red specimens and totally dark brown ones. Size seems to vary less than color, but one of the specimens of *A. tibialis* studied is nearly one third smaller than the other one. The pilosity and microsculpture of the dorsal surface appear quite constant within each species. If *A. costaricensis* and *A. melanocera* are two different species and not two races with different sexual dimorphism, *A. melanocera* is a very constant species in spite of being the most widely distributed one. All the studied specimens of it are almost alike. In the case of *A. candezei*, although it has not been possible to distinguish allopatric subspecies, a weak tendency has been observed towards predominance of dark specimens in the northern part of the range of the species from where no unicolorous red specimens have been seen. In *A. variabilis*, with similar type of chromatic variation, no such tendency has been detected.

### CLASSIFICATION

(Figure 1)

Two divergent lines, represented by two different genera, may be recognized:

1. *Aulacoscelis*, restricted to the Central American area and adjacent parts of the southwestern United States and including the less specialized species.
2. *Janbechynea*, which includes more differentiated species and extends as far south as Peru, Brazil and Bolivia.

*Aulacoscelis grandis* may prove to represent an independent subgenus or even a genus; its inclusion in *Aulacoscelis* is doubtful and due to the fact that I have not seen a male of the species.

The remaining species of *Aulacoscelis* seem to be rather closely

related and the differentiation between them is not always easy.

The genus *Janbechynea* may be divided into two well defined subgenera, which represent two different levels of differentiation :

1. *Bothroscelis*, with the species *melyroides* and *fulvipes*, considered as connecting *Aulacoscelis* and *Janbechynea* but more closely related to the second, and
2. *Janbechynea s. str.* including the most atypical species of the subfamily and representing the most peculiar Aulacoscelinae. Although the three included species bear a close resemblance, they may be grouped as follows:
  - 2a. *J. (J.) elongata* from Mexico, in which the subgeneric characters are not fully expressed and in which sexual dimorphism consists in longitudinal costae on elytra in ♀.
  - 2b. *J. (J.) inverosimilis* and *J. (J.) paradoxa*, from Peru, Bolivia and Brazil, with a very peculiar type of ♀ (no ♂ ♂ are known of those species) and a tendency to modification of the metacoxae which, although already present in *J. (J.) elongata*, reaches its maximum in *J. (J.) paradoxa*.

The differentiation between the species of *Aulacoscelis* and those of *Janbechynea* seems to be closely correlated with the geographic distribution, and the isolation of the South American species has probably contributed to their greater distinctness.

The pronotal fold, peculiar to *Aulacoscelis*, is lost in *Janbechynea s. lat.* and the basal groove which remains in that genus as the only evidence of the fold tends to disappear; in *J. (J.) paradoxa* it is less conspicuous than in *J. (Bothroscelis) melyroides*, for instance.

#### NOTES ON PHYLOGENY

It is not probable that feeding on Cycadophyta is a derivative habit in Aulacoscelinae. The origin of the group probably precedes the appearance of the angiosperms. If so, the Aulacoscelinae are among the most ancient of living Chrysomelidae.

From the fact that the sagrid genus *Carpophagus* in Australia has also been reported on Cycadaceae and that it represents another and quite different line of evolution, it may be concluded

that the Chrysomelidae differentiated in early times (before the Jurassic period, for the gymnosperm-feeders) and that each one of the archaic living types is the relict of a different evolutionary line. Correlated with morphological and ethological characters, this may provide a clue to breaking up the immense number of chrysomelid species — of which more than 30,000 are already described — into smaller families of common but ancient ancestry. The uniformity of appearance of chrysomelids is undoubtedly due to their fairly uniform mode of life and requirements, but it must not be allowed to hide the fact of their very early divergence.

As for the center of origin of the Aulacoscelinae, the existing forms seem to have a relict distribution, and the data are insufficient for speculation. The isolation in South America of *Janbechynea inverosimilis* and *J. paradoxa*, which differ very much from the Central American *Aulacoscelis*, suggests a rather ancient and probably much wider distribution.

### Key to the Genera

Prothorax with a short longitudinal fold on each side, extending from basal margin to beginning of disc. Scutellum triangular . . . . *Aulacoscelis*

Prothorax without such folds but with two basal grooves, contiguous to basal margin. Scutellum transverse and more or less triangular

*Janbechynea*

### I. Genus AULACOSCELIS Duponchel and Chevrolat

Duponchel and Chevrolat, 1843, p. 338; Stål, 1863, p. 341; Chapuis, 1874, p. 54; Jacoby, 1880, p. 1; Crowson, 1946, p. 83; Monrós, 1949, p. 547.

*Etymology*: From the Greek *aulacos* and *scelis* (fold and leg).

*Type of genus*: *Aulacoscelis melanocera* Dup. & Chev., monobasic.

To define this genus, the general description of the subfamily may be supplemented as follows: Form more or less flattened, size from about 6.5 to about 12.5 mm. Integuments without metallic colors and rather soft. Head similar in both sexes. Prothorax with a short longitudinal basal fold on each side, extending from the basal margin to the posterior half of the disc and limiting a groove between this fold and the dilated basal margin of pronotum (fig. 15). Elytra irregularly punctured or

almost smooth, rarely with dense pubescence; sometimes with longitudinal costae which are always more visible in ♀. Scutellum triangular. Trochantin visible in antero-lateral angle of anterior coxae.

*Key to the Species of Aulacoscelis*

1. Elytra with dense and fine, rather long, pubescence throughout (fig. 13). Sides of pronotum subparallel, narrowed in front, and separated from disc by a broad and rather deep longitudinal depression. Pronotal surface uneven and with longitudinal tracts of decumbent pilosity. Black; elytra yellowish to reddish (fig. 37) . . . . . *grandis*  
 Elytra glabrous or almost so (figs. 4-12). Pronotum of different shape and sculpture . . . . . 2
2. Pronotum rather densely and deeply punctured and not shining (figs. 11 and 47) . . . . . *variabilis*  
 Pronotum smooth and shining, almost impunctate . . . . . 3
3. Elytra elongate and subparallel on basal 2/3; about as wide at base as in the middle . . . . . 4  
 Elytra more or less oblong elongate, broader towards middle than at base . . . . . 6
4. Antennae slender; segments 8-10 distinctly longer than wide at apex (fig. 18) . . . . . 5  
 Antennae broader; segments 8-10 almost as wide at apex as long (fig. 17). Humeral elytral depression with long erect bristles. *högei*
5. Elytra with 3 more or less raised longitudinal carinae, of which the central one is shorter than the others and oblique; elytral disc brown or dark to a variable extent (fig. 16) . . . . . *candezei*  
 Elytra without carinae or only with a sublateral, rather feeble one in the ♀; dorsal surface reddish unicolorous . . . . . *confusa*
6. Black; elytra yellowish (fig. 35) . . . . . *melanocephala*  
 Coloration different . . . . . 7
7. Sides of prothorax rather broadly expanded, its disc depressed. Yellow with apex of femora, tibiae and tarsi black (figs. 54-55) *tibialis*  
 Sides of prothorax less expanded; its disc moderately convex. Reddish . . . . . 8
8. Pronotum distinctly transverse, its sides very slightly curved. Form comparatively short and broad. Elytra not shining (fig. 36) . . . . . *sanguinea*  
 Pronotum subquadrate, distinctly narrowed at base. Form more elongate and slender . . . . . 9

9. Legs completely black. Elytra finely shagreened and with humeral longitudinal costa in ♀; shining and without costa in ♂ (figs. 21, 22) . . . . . *costaricensis*  
 Basal 2/3 of femora orange-red like rest of body. Elytra as in ♂ of *A. costaricensis* and without sexual dimorphism. . . . . *melanocera*

### 1. AULACOSCELIS CANDEZEI Chapuis

(Figures 4, 16)

Chapuis, 1874, p. 55, atlas, pl. 111, f. 6; Jacoby, 1880, p. 1; 1888, p. 2, pl. 35, f. 7; Crowson, 1946, p. 90.

*A. purpurea* Horn, 1892, p. 46; Crowson, 1946, p. 90 (new synonym).

United States. New Mexico (Horn): Las Vegas (1 ♂ Barber & Schwarz in USNM); Albuquerque (1 ♂ Wickham in USNM); Isleta (1 ♂ June 14, 1953 in col. Monrós, on flowers of Compositae). Arizona (3 col. Horn in PAS; 1 ♂ Ulke in CM): Walnut (1 ♂, 1 ♀ Wickham in USNM); Pinal Mts. (2 ♂ col. Van Dyke in CAS); Flagstaff (1, W). California: Needles (1 ♀ Wickham in USNM).

Mexico. Tepic (1 ♂ June 24, 1940 L. W. Saylor in CAS); Durango: Ventanas (3 ♂ Höge in col. Jacoby, col. Bowditch MCZ); Cerro de Plumas, San Miguel del Rio (Jacoby).

Guatemala (Chapuis).

*Sexual dimorphism* involves the basal segments of tarsi I and II and the last sternite.

*Measurements.* ♂ 6.8 x 2.1 to 8.7 x 2.8 mm.; ♀ 7.5 (Crowson) to 8.8 x 3.2 mm.

*Form.* Subcylindrical, moderately shining, sometimes with feeble violaceous metallic lustre. Color variable, from ochraceous yellowish with elytral disc more or less brownish, to obscure brown unicolorous with appendages black. Some intermediate specimens with head reddish brown, prothorax dark brown, elytral disc dirty brown with violaceous lustre on yellow ground; others with head dark brown, prothorax orange, elytra dirty brown, etc.

*Punctuation.* Head with some sparse, rather deep punctures, some with single short bristles. Prothoracic punctures smaller but more dense. Elytral punctures shallow, rather large and dense, most with one or two very short decumbent hairs.

*Microsculpture.* Minute granulation which somewhat diminishes the smoothness of the surface and is more visible in dark specimens or on dark areas.

*Pilosity.* Labrum with some long bristles on anterior margin. Sides of clypeus, antennae and sides of prothorax with whitish, decumbent, medium sized, moderately dense hairs; some sparse hairs of same type on postero-lateral pronotal margin. Elytra with some very short, decumbent setae, more abundant on basal third and placed one or two in most of the punctures. Ventral surface and legs with rather long but not dense pilosity, except on head and prosternum, which are glabrous and shining.

*Head.* With the buccal parts, somewhat elongate in shape. Antennae slightly longer than half the body; basal segment subglobose; apical one elongate rhombiform; intermediate ones obtusely triangular or subconical, slightly compressed, each one (except 2) distinctly longer than wide; segments 4-7 as much compressed as segments 8-10.

*Pronotum.* Feebly transverse. Sides slightly sinuate at basal third. Greatest width at anterior third. Disc slightly convex and without impressions.

*Elytra.* Elongate, subparallel in basal two-thirds, acute towards the apex, with apical margin subtruncate and somewhat dehiscent. Suture with a narrow raised border. Each elytron with a sublateral, longitudinal, distinct carina, which limits the lateral declivity, another one discal, parallel to the suture, and more or less fused to the preceding one at apex; and between them a third one, oblique, which begins at shoulder and ends near discal costa about mid-length of elytron. Carinae distinct in both sexes, but more so in the ♀.

*Ventral surface and legs.* Normal. Basal segments of tarsi I and II distinctly broadened in ♂. Last sternite subtruncate in ♂.

*Male genitalia.* Normal.

*Host plant.* One ♂ specimen of this species has been collected on flowers of Compositae in New Mexico (Monrós).

*Remarks.* Although the original description of this species is rather vague and although I have not been able to find out where the type specimens are, the figure given by Chapuis of *A. candezei* makes its identification rather sure. The identity of *A. candezei* and *A. purpurea* (of which I have seen holotype and 2 paratypes in PAS) is complete, and the latter name represents only a minor color variation without any significance.

It is the only known species of the genus with the described type of elytral coloration combined with the elytral costae.

## 2. AULACOSCELIS HÖGEI Jacoby

(Figures 5, 17, 19, 20)

Jacoby, 1888, p. 3; Crowson, 1946, p. 90 (pars).

Mexico. Guerrero: Chilpancingo (1 ♀ cotype #8448 Höge in col. Jacoby, col. Bowditch MCZ; 5 ♀ col. Bowditch MCZ); Mexcala (1 ♂ allotype, 2 ♀ June 29, 1951, H. E. Evans in CU; 1 ♂, 2 ♀ col. Monrós *ex* CU, collected at light).

*Sexual dimorphism* as in *A. candezei*.

*Measurements.* ♂ 8.1 x 2.9 mm.; ♀ 9.2 x 3.2 mm.

*Form.* Similar to *A. candezei*. Color yellowish orange to brick red, with antennae, palpi, apices of femora, tibiae, and tarsi black.

*Punctuation.* Punctures on head and prothorax as in *A. candezei*; on elytra smaller and feebler.

*Microsculpture.* Of same type as *A. candezei*, but less conspicuous.

*Pilosity.* Head and pronotum like *A. candezei*. Elytra with some sparse, erect, short, golden bristles.

*Head.* Of same type as *A. candezei*. Antennae slightly shorter than half the body, of same general type as *A. candezei*, but segments shorter and more triangularly compressed, especially 8-10 which are almost as wide at apex as long. The whole antenna is distinctly more robust than in *A. candezei*.

*Pronotum.* About as wide as long, with greatest width at middle; otherwise similar to that of *A. candezei*.

*Elytra.* Elongate, subparallel in basal two thirds, acute towards the apex, with apical margin almost entire. Suture with a narrow raised border. Carinae as in *A. candezei*, but less distinct and almost invisible in ♂ and sometimes only the lateral one is visible in ♀.

*Ventral surface and legs.* Normal. Basal segments of tarsi I and II broadened in ♂, but less so than in *A. candezei*. Last sternite subtruncate in ♂.

*Male genitalia.* Normal (figs. 19, 20).

*Remarks.* This species is very similar to the following one (*confusa*, *q.v.*). From *A. candezei*, to which it is also closely related, *A. högei* may be distinguished by the somewhat shorter and distinctly broader antennae with more compressed segments, as well as by the less raised elytral costae and the short, erect elytral bristles, absent in *A. candezei*.

3. AULACOSCELIS CONFUSA n.sp.  
(Figures 6, 18)

*A. högei* Jacoby, 1888, p. 3, pl. 35, f. 6; Crowson, 1946, p. 90 (pars.).  
"Canada: Van Couver Island" (1 allotype ♂ col. Jacoby, col. Bowditch MCZ, in bad shape; 1 paratype ♀ same data, with label "type 8448 of *A. högei*.")  
Mexico. Tehuantepee (1 holotype ♀ #29238 in col. Bowditch MCZ; 1 paratype ♀ same data; 1 paratype ♀ T. F. Sumichrast in col. Monrós, ex Bowditch MCZ).

This species is so closely related to *A. högei*, with which it has been confused, that only the differences need to be pointed out.

*Measurements.* ♂ (allotype) 7.8 x 2.8 mm.; paratype ♀ 8.8 x 3.5 mm.

*Color.* Like *A. högei*, but dark parts dark brown (not black).

*Pilosity.* Elytra with some sparse, erect, rather long bristles in humeral depression, more conspicuous when observed from the side.

*Head.* Antennae as in *A. candezei*, i.e. more slender, somewhat longer, and less compressed than in *A. högei* (fig. 18).

*Elytra.* Completely without costae in ♂ and with only 1 feeble one in ♀, corresponding to the discal-lateral one in *A. högei* and *A. candezei*.

*Legs.* Basal segments of tarsi I and II somewhat broadened in ♂, but less so than in *A. högei* and much less than in *A. candezei*.

*Male genitalia.* Not examined.

*Remarks.* This species has been confused with the preceding one by Jacoby and probably also by Crowson, so that it is not possible to accept the localities they give without checking each one of them.

In spite of being very closely related, *A. confusa* may be distinguished from *A. högei* by its longer and more slender antennae, and also by the presence of erect bristles on the humeral depression of the elytra, these bristles being entirely absent in *A. högei*. The whitish bloom described by Jacoby on *A. högei* actually occurs on the present species and not on the real *A. högei*. From *A. candezei*, to which it is also more or less similar, the present species may be distinguished by color as well as by near absence of elytral costae and presence of erect bristles on the humeral



depression. From *A. melanocera* and related forms of similar coloration, it differs in being more elongate and slender.

The specimens recorded by Jacoby as *A. högei* from Vancouver Island belong to the present species as does the one illustrated in the *Biologia Centrali Americana* under the name *A. högei*. I have examined the specimens labeled "Van Couver Island" and they completely agree with the typical specimens from Tehuantepec. It is almost certain that the "Vancouver Island" specimens are wrongly labeled.

#### 4. AULACOSCELIS MELANOCERA Duponchel and Chevrolat (Figures 7, 15, 31 to 34)

Duponchel and Chevrolat, 1843, p. 338; Stål, 1863, p. 342; Jacoby, 1880, p. 2; Crowson, 1946, p. 90; Monrós, 1949, figs. 6, 9, 14, 21, 23.

Mexico (Duponchel and Chevrolat, Stål); Oaxaca, N. Yucatan (Jacoby); S. Mexico (Crowson); Oaxaca: Almoloya (1 ♂, 2 ♀ F. Knab in USNM, det. *A. högei*); Vera Cruz (1 USNM, W. Anderson det.); Nogales (1 ♀ June 16, 1905 F. Knab in USNM); Tampico (1 ♂, 1 ♀ June 1910 Palmer in USNM); N. Yucatan (1 ♀ USNM, Jacoby det.); Mexico (1 Bowditch leg. USNM; 3 col. Bowditch MCZ; 3 col. Jacoby in col. Bowditch MCZ); Paristlahuaca (1 Sallé leg. in col. Jacoby, col. Bowditch MCZ); Tamazunchale (5 col. USNM, intercepted at Laredo); Cerro de Plumas (3 Höge leg. in col. Jacoby, col. Bowditch MCZ); Huauhinango (1 col. Bowditch MCZ); Oaxaca (2 Höge in Bowditch MCZ); N. Yucatan (1 Gaumer leg. in col. Jacoby, col. Bowditch MCZ); Jalapa (Flohr leg. in col. Jacoby, col. Bowditch MCZ); Vera Cruz: Atoyac (1 col. Jacoby, col. Bowditch MCZ).

Guatemala. Chacoj, Panzos (Jacoby); Vera Paz: Chacoj (4 Champion in col. Jacoby, col. Bowditch MCZ).

Honduras. Siguatepeque (3 Rittenhouse in USNM).

Nicaragua. Managua: La Calera (3 ♂, 4 ♀ May 14, 1952 R. B. Swain in USNM).

Panama (Crowson). Volcan de Chiriqui (Jacoby); Panama city (3 col. Bowditch MCZ).

Canal Zone. Summit (1 ♂, 2 ♀ June 12, 1928 Zeteck in USNM).

El Salvador (85 S. Calderon in USNM).

Published localities in Costa Rica are not listed as it seems probable that they really concern *A. costaricensis*.

*Sexual dimorphism* as in *A. candezei*.

*Measurements.* ♂ 7.7 x 2.8 mm.; ♀ 8.2 x 3.1 mm. (somewhat variable, plus and minus)

*Form.* Oblong, rather short, moderately convex and shining, broader and more depressed than preceding species. Red, with antennae (except basal segments), tarsi, tibiae and apices of femora black. The red color varies from pale orange to blood red. In one of the specimens examined the legs are completely black.

*Punctuation.* Head and prothorax almost impunctate. Elytral punctures small and moderately dense, smaller towards apex.

*Microsculpture.* Surface smooth and shining, micro-reticulation not visible.

*Pilosity.* Head and prothorax as in preceding species. Elytra with some very sparse, erect, short bristles, especially on basal half. Ventral pilosity whitish.

*Head.* As in preceding species. Antennae little longer than half the body, of the general type of *A. candezei* but somewhat less slender (and in that respect more similar to *A. högei*).

*Pronotum.* Very slightly transverse, of same shape as in preceding species.

*Elytra.* Elongate, suboblong, separately rounded at apex and without apical sutural denticle. Suture with a narrow raised border. Sides moderately expanded. Surface moderately shining, moderately convex, with a distinct post-scutellar depression and a humeral sulcus. In the ♀, the elytra show a feeble and sometimes almost obsolete humeral carina which is totally absent in the ♂.

*Ventral surface and legs.* Normal. Basal segments of tarsi I and II broadened in ♂. Last sternite notched in ♂.

*Male genitalia.* Normal (figs. 33, 34).

*Host plants.* *Cycas revoluta* (specimens from El Salvador in USNM); cycad plant (specimens from Tamazunchal in USNM); palm (specimen from Honduras in USNM).

*Remarks.* This is the type species of the genus and also one of the most typical *Aulacoscelis*. It is the most common species in collections and the most widely distributed one. The resemblance between the present species and *A. högei* or *A. confusa* is only superficial; the body shape as well as the elytral punctures are quite different.

5. *AULACOSCELIS COSTARICENSIS* Bechyně  
(Figures 8, 21 to 30)

Bechyně, 1950, p. 237.

Costa Rica. San Carlos (9♂, 2♀ Schild & Burgdorf in USNM, topotypes; 1♂ with label "A. melanocera"); Naranjo (1♀ Bowditch leg. USNM); Aleluya (2♂, 4♀ E. Morales M. in USNM); Concavas (7♂, 9♀ May 17, 1938, Lankester leg. col. Nevermann in USNM); San José (2♂ Underwood in col. Bowditch MCZ).

*Sexual dimorphism* involves the basal segments of tarsi I and II, the elytra, and the last sternite

*Measurements.* ♂ 8.2 x 2.9 mm.; ♀ 8.4 x 2.8 mm.

*Form.* As in *A. melanocera*. Color identical, except legs entirely black, and red color always somewhat darker.

*Punctuation and pilosity.* As in *A. melanocera*.

*Microsculpture.* Male smooth and shining, without visible microsculpture; ♀ with a fine shagreen on elytra which makes them less shining.

*Head and pronotum.* As in *A. melanocera*.

*Elytra.* Male as in *A. melanocera*. Female somewhat broader, subtruncate at apex, and with a distinct longitudinal sublateral carina beginning at shoulder and ending at anterior third.

*Ventral surface and legs.* As in *A. melanocera*.

*Male genitalia.* Normal (figs. 27 to 29).

*Host plant.* Nevermann's specimens in USNM with label "Frisst an Blatt von *Cycas revoluta*."

*Remarks.* The main difference between the present species and *A. melanocera* is the different type of sexual dimorphism; the difference in coloration of the legs seems not important since specimens of *A. melanocera* occur with legs completely black. Whether these two forms are specifically different or whether they are merely subspecies of one species, must be decided by study of more and more significant material.

6. *AULACOSCELIS SANGUINEA* Jacoby  
(Figures 9, 36, 39)

Jacoby, 1888, p. 5, pl. 35, f. 10; Crowson, 1946, p. 89.

Mexico. Guerrero: Chilpancingo (1♂ col. Jacoby in Bowditch MCZ, co-type).

*Sexual dimorphism* (according to Crowson) involves the elytral apex.

*Measurements.* ♂ 8 x 2.8 mm

*Form.* As in *A. melanocera*. Antennae entirely black.

*Punctuation and pilosity.* As in preceding species.

*Microsculpture.* Elytra with distinct microgranulation, less shining than in *A. melanocera*.

*Head.* Antennae somewhat longer and more slender than in *A. melanocera*.

*Pronotum.* Slightly transverse; sides very slightly arcuate; greater width at middle; anterior and basal margins of almost equal width; sides not constricted at base.

*Elytra.* Rather broad and short, widest behind middle, with lateral margins expanded. Humeral impression almost obsolete. According to Crowson, the ♀ has an apical denticle on elytral suture, which distinguishes it from the ♂.

*Ventral surface and legs.* Normal.

*Male genitalia.* Normal (fig. 39).

*Remarks.* I have examined only one ♂ to which the preceding description refers.

This species, although appearing similar to *A. melanocera* and *A. costaricensis*, may be easily distinguished by the different shape of pronotum and less shining elytra, which are also shorter and broader.

#### 7. *AULACOSCELIS MELANOCEPHALA* Jacoby (Figures 10, 35, 38)

Jacoby, 1877, p. 510; 1880, p. 2, pl. 1. f. 1.

Guatemala. (1♂ holotype in col. Jacoby, col. Bowditch MCZ).

*Measurements.* ♂ 9.0 x 3.3 mm.

*Form.* As in *A. sanguinea*. Color black, with a feeble reddish tint dorsally and the elytra ochraceous yellow.

All the characters almost identical with *A. sanguinea*, from which it is distinguished by different ♂ genitalia (fig. 38).

#### 8. *AULACOSCELIS VARIABILIS* Jacoby (Figures 11, 40 to 53)

Jacoby, 1888, p. 4, pl. 35, f. 8, 9; Crowson, 1946, p. 90.

Mexico. Hidalgo: Pachuca (4♂, 7♀ Höge leg. in col. Jacoby col. Bowditch

MCZ, cotypes; 3 Höge leg. USNM, Jacoby det., cotypes); Sierra de Durango (3, col. Bowditch MCZ); Real del Monte (1, Flohr leg. col. Jacoby, col. Bowditch MCZ, cotype).

*Sexual dimorphism* involves only the last sternite. Basal segments of tarsi almost equal in both sexes. No sexual dichromism.

*Measurements.* 8.4 x 2.9 mm. to 8.7 x 3 mm.

*Form.* Oblong-elongate, rather depressed, not shining. Color variable: dirty brown either unicolorous (about half the specimens examined) or with prothorax and elytral epipleurae orange-red to a variable extent.

*Punctuation.* Cephalic punctures rather dense and deep, especially towards base, most of them with a short, white, oblique bristle. Pronotal punctures sparser, especially on disc, but denser and deeper than in preceding species. Elytral punctures closer than those of prothorax, most with a very short, white bristle directed obliquely backwards.

*Microsculpture.* Dorsal surface of body with a minute reticulation which makes it dull.

*Pilosity.* Of the same type as in preceding species; elytra with some longer hairs on shoulders, and entirely covered with the very short ones already described.

*Head.* Antennae about half the length of body, slightly compressed, of the type of *A. candezei*; antennal pilosity shown in Figures 49 to 51.

*Pronotum.* About as wide as long. Sides slightly sinuate at basal third. Disc rather depressed and sometimes with two shallow, irregularly rounded depressions.

*Metendosternite.* Shown in Figure 53, similar to that of *A. candezei* figured by Crowson.

*Elytra.* Elongate, subparallel in basal two thirds and acute at apex, where very slightly dehiscent; without sutural denticle. Suture narrowly bordered; sides moderately expanded, more so in basal half. Surface rather flat, each elytron with a slight post-scutellar depression and another, elongate one, on the shoulder.

*Ventral surface and legs.* Normal, similar in both sexes. Last sternite of ♂ deeply notched.

*Male genitalia.* As shown in Figures 44 to 46.

*Remarks.* This is a very easy species to recognize because of the dull pronotum, the rather depressed body, and the dense dorsal punctures.

## 9. AULACOSCELIS TIBIALIS Jacoby

(Figures 12, 54 and 55)

Jacoby, 1888, p. 3, pl. 35, f. 2; Crowson, 1946, p. 88.

Guatemala. Vera Paz: San Juan (Jacoby); Senahú (1 ♀ cotype Champion leg., in col. Jacoby, col. Bowditch MCZ).

British Honduras: M-tee Dist. (1 ♂, 1 ♀ August 10, 1906 col. Bowditch MCZ).

*Sexual dimorphism* involves the tarsi, abdomen and elytra.

*Measurements.* ♂ from Honduras 10.6 x 3.7 mm.; ♀ cotype 12.6 x 5 mm.; ♀ from Honduras 7.4 x 3 mm.

*Form.* Oblong-elongate, rather flat, moderately shining. Pale yellow to orange-yellow; antennae (except basal segments), palpi, tarsi, tibiae, and tips of femora black

*Punctuation.* Cephalic punctures sparse and superficial, very few of them with short, decumbent bristles. Prothorax almost impunctate. Elytral punctures sparse and superficial, with some sparse decumbent hairs in them at base and sides.

*Microsculpture.* Dorsal surface minutely shagreened, but this does not affect the lustre and is visible only under strong magnification.

*Pilosity.* Dorsal surface practically glabrous.

*Head.* As shown in Figure 55. Antennae half the body length, with segments 3-7 somewhat compressed, increasing in length from second to apical one.

*Pronotum.* Rather depressed, shape as shown in Figures 54 and 55.

*Elytra.* With sexual dimorphism. Male, oblong-oval, elongate, with maximal width behind middle, the surface practically without irregularities, except for the humeral callus and the sub-lateral depression; ♀ with 3 longitudinal costae of which the external one is long and well developed, the internal one short and very feeble, and the intermediate one visible especially on the shoulder; between the last carina and the lateral declivity there is a rather inconspicuous fold.

*Ventral surface and legs.* Normal. Basal segments of tarsi I and II broadened in ♂. Last sternite as in preceding species.

## 10. AULACOSCELIS GRANDIS Jacoby

(Figures 13, 37)

Jacoby, 1888, p. 6, pl. 35, f. 1 ♂; Crowson, 1946, p. 88.

Mexico. Durango: Ventanas (Jacoby); Mexico (1 ♀ Flohr leg. col. Jacoby col. Bowditch MCZ).

*Measurements* (♀). 10.9 x 3.2 mm.

*Form* (♀). Elongate oval, depressed; widest behind middle. Black, elytra orange-brownish.

*Punctuation*. Head with some small punctures, each with a long hair. Prothorax with punctures only at base of hairs. Elytral punctures moderately dense and deep.

*Microsculpture*. Head, prothorax, and scutellum smooth and shining; elytra inconspicuously finely shagreened.

*Pilosity*. Labrum with long, white setae directed forward. Interocular depression with long, crossed hairs; postocular region with similar hairs, directed forward. Prothorax with two longitudinal irregular rows of hairs on each side of disc, and a dense pilosity on all margins. Scutellum with some sparse hairs. Elytra with a fringe of bristles along the margin, longer towards apex; and surface with rather dense, rigid bristles, directed backwards. Pilosity of ventral surface, antennae, and legs fine and moderately dense.

*Head*. Elongate, depressed; eyes small and rather prominent; postocular region slightly constricted and with a transverse impression on each side; interocular and interantennal space depressed, limited on each side by a thick carina; clypeus on a lower level than rest of head. Antennae half body length, with segments 3-8 moderately, triangularly expanded (the fourth is the most expanded, and from it the antenna diminishes in width toward apex and base).

*Pronotum*. About as long as wide, with sides somewhat convergent anteriorly. Anterior margin feebly bilobed. Sides with narrow, elevated margins, separated from disc by broad and shallow depressions. Base subtruncate, narrowly bordered. Disc scarcely convex, with feeble impressions arranged as shown in Figure 37, and with a short but distinct longitudinal carina on each side at base.

*Elytra*. Elongate, depressed, gradually broadened in basal two thirds, then conjointly and broadly rounded. Suture nar-

rowly bordered. Lateral margins horizontally expanded and separated from the disc by very distinct longitudinal impressions, which disappear towards apex.

*Ventral surface and legs.* Normal.

*Remarks.* The specific name of this species may lead to confusion, as *A. tibialis* is larger than the present one. *A. grandis* is very peculiar looking, and its prothorax as well as the antennal shape easily distinguish it from the other *Aulacoscelis*.

## II. Genus JANBECHYNEA Monrós

Monrós, 1953, p. 21.

*Etymology:* Named for Jan Bechyně, a specialist on Chrysomelidae.

*Type of genus:* *Janbechynea paradoxa* Monrós, monobasic and orthotype.

The addition of some other species to the present genus makes the following modification of the generic description necessary: Form elongate and somewhat acute. Head distinctly broader in ♂. Antennae at least as long as half length of body in both sexes; segments elongate-triangular, not much expanded internally. Pronotum with a basal elevated margin, and in front of it, on each side, a deep circular impression (fig. 14); pronotal disc without longitudinal fold at base. Scutellum transverse-rectangular. Elytra densely covered with fine pilosity. Legs rather long and slender. Male genitalia with median lobe prolonged into a long median projection.

This genus, thus redescribed, may be distinguished from *Aulacoscelis* by the lack of pronotal folds, the different shape of the scutellum, the different type of ♂ genitalia, and the sexual dimorphism of the head. In *Aulacoscelis* (except *A. grandis*, which is doubtfully included in that genus) the elytra are glabrous or almost so. In all the species of *Janbechynea* they are covered by dense pilosity.

The present genus is divided into two subgenera, distinguished in the following key.

Elytral apices rounded in both sexes, moderately dehiscent.

Elytra not sexually dimorphic. Size smaller (up to 10 mm.).

Abdomen of normal length in both sexes . . . . *Bothrosclis*

Elytral apices in the ♀ prolonged into divergent points and



strongly debiscent. Elytra with sexual dimorphism. Size larger (over 13 mm.). Abdomen shortened, especially in the ♀. . . .

*Janbechynea s. str.*

### A. subgenus BOTHROSCELIS nov.

*Etymology:* From the Greek *bothros* (groove) and *scelis* (leg).

*Type of subgenus:* *Aulacoscelis fulvipes* Jacoby.

The differences between the present subgenus and *Janbechynea s. str.* are given in the preceding key.

*Bothroscelis* contains species which are less differentiated from *Aulacoscelis*, while *Janbechynea s. str.* includes the most specialized species and those which differ most from the rest of the *Cyclica*.

The subgenus *Bothroscelis* includes two known species.

Elytral pubescence decumbent and dense. Prothorax densely and deeply punctured, with distinct pubescence along the borders

(figs. 64, 65) . . . . . *fulvipes*

Elytral pubescence recumbent and sparser. Prothorax with only some punctures on marginal areas and some scattered bristles

on lateral borders (fig. 57) . . . . . *melyroides*

### 1. JANBECHYNEA (BOTHROSCELIS) MELYROIDES (Crowson)

(Figures 57, 63)

*Aulacoscelis melyroides* Crowson, 1946, p. 89.

Mexico. Guerrero: Chilpancingo, 4600 ft. H. H. Smith (Type locality; 1 ♂, 1 ♀ paratypes in coll. Monrós, ex British Museum).

*Sexual dimorphism* involves the head and elytral pilosity.

*Measurements.* ♂ 6-7 mm; ♀ 5-7 mm. (according to Crowson).

*Form.* Elongate-oblong, subdepressed, elytra subparallel. Shining, rather densely pubescent on elytra. Color variable (sexual dichromism?): ♂ dark brown, almost black on head and elytra, paler and reddish on legs and antennae, mouth parts yellowish, pronotum yellow with a discal, ill-defined, large brown patch and elytral epipleurae pale yellow; ♀ with elytra and basal half of head deep black, rather shining, pronotum unicolorous yellow, anterior half of head yellow; otherwise, including elytral epipleurae, as in ♂.

*Punctuation.* Cephalic punctures sparse, rather deep, most

with fine, oblique bristles. Pronotal punctures of same type, very distinct but not dense on disc. Elytral punctures shallower but closer than those of head and prothorax, with hairs.

*Microsculpture.* Head and pronotum smooth and shining; elytra with a fine but distinct microgranulation.

*Pilosity.* Head with some long setae on clypeus and labrum and shorter ones rather sparse on front and interocular area. Antennal pilosity of same type as in *Aulacoscelis*. Prothorax almost glabrous except for fringes of bristles on anterior and basal margins and some sparse bristles near basal angles at sides. Scutellum with some long, decumbent setae. Elytra dimorphic: male with rather long, moderately dense hairs, directed obliquely backwards and almost uniformly distributed, lateral margins with fringes of short, dense bristles; ♀ with pilosity longer, finer, and more erect, especially on basal half; lateral fringes longer and finer.

*Head.* Male almost as broad as long and of the normal *Aulacosceline*-type. Antennae somewhat longer than half the body, its segments elongate and rather slender, 5-11 more than twice as long as broad at apex. Female narrower and more elongate than ♂. Antennae shorter than half body length and somewhat more robust than in ♂ but of same general form.

*Pronotum.* In ♀ of normal *Aulacosceline*-type, as (for instance) in *A. melanocera*; in ♂ more subparallel, with less conspicuous lateral-basal constriction. Basal fold and discal impressions absent; basal grooves distinct and deep.

*Elytra.* Elongate, subparallel in basal two thirds, moderately acute towards apex, where they are somewhat dehiscent. Sutural angles without denticles. Suture with a narrow raised border. Sides slightly horizontally expanded. Surface rather flat in both sexes, with an inconspicuous, longitudinal, short humeral carina in the ♀ but completely absent in the ♂.

*Ventral surface and legs.* Normal. Abdomen somewhat shortened in ♀.

*Remarks.* The erect elytral pilosity, together with the smooth pronotum and the small size, easily distinguish the present species from *J. fulvipes*, with which it has been confused.

## 2. JANBECHYNEA (BOTHROSCELIS) FULVIPES (Jacoby)

(Figures 56, 64 to 71)

*Aulacoscelis fulvipes* Jacoby, 1888, p. 4; Crowson, 1946, p. 90.

*Aulacoscelis femorata* Jacoby, 1888, p. 5, pl. 35, f. 3 ♂, 4 ♀; Schaeffer, 1905, p. 168; Crowson, 1946, p. 88 (new synonym).

*Aulacoscelis ventralis* Schaeffer, 1933, p. 297.

United States. Arizona: Huachuca Mts. (4 ♂, 3 ♀ July, 1905 C. W. Leng in Hopping col. CAS; 3 ♀ col. Schaeffer in USNM); Carr Canyon (1 ♂ J. O. Martin in CAS; 1 ♀ August 6, 1924 E. P. Van Duzee in CAS); Cochise Co.: Palmerlee (1 ♂, 1 ♀ col. Schaeffer in USNM).

Mexico. Chilpancingo (Jacoby), Capulalpam (Jacoby); Durango: Ventanas (1 ♂, 7 ♀ cotypes col. Jacoby in col. Bowditch MCZ); Chihuahua (8 ♂, 5 ♀ Wickham leg. in col. Bowditch MCZ); Guanajuato (1 Sallé leg. col. Jacoby in col. Bowditch MCZ).

*Sexual dimorphism* involves the last sternite, head, antennae, and somewhat shortened abdomen in ♀. Basal segments of tarsi almost equal in both sexes.

*Measurements.* 8 x 2.8 mm. to 8.7 x 3 mm.

*Form.* Subcylindrical, acute towards apex. Color variable, from testaceous with apices of femora and bases of tibiae brown, to reddish-brown with legs and apex of abdomen yellowish brown, with a wide variety of intermediate colorations (head dark brown, prothorax orange, elytra reddish brown; head and prothorax orange, elytra grayish brown, etc.)

*Punctures.* Head densely and rather deeply punctured, especially near base; most of the punctures with short decumbent bristles. Elytral punctures rather close, each with a long, decumbent hair. Prothoracic punctures variable, from rather sparse and shallow to dense and deep, especially on anterior angles.

*Microsculpture.* Microgranulation present without dulling the surface, but hidden by the pilosity on prothorax and elytra.

*Pilosity.* Head with some decumbent, sparse, short hairs. Scutellum and elytra covered with moderately long, rather dense, decumbent, slightly depressed hairs. Pronotal pilosity variable; specimens with dense punctation have also dense pilosity, especially on sides; in others the pilosity is sparser but basically similar.

*Head.* Transverse, interantennal depression U-shaped, open behind, rather deep. Clypeus at level of antennal border. Anten-

nae of same type as in *Aulacoscelis variabilis*, longer than half the body, moderately expanded.

*Prothorax.* Somewhat transverse, with anterior margin slightly broader than basal one. Sides slightly constricted in basal third in both sexes, but more so in ♀. Disc with two transverse depressions near anterior angles, more impressed on specimens with abundant pilosity.

*Elytra.* Elongate, acuminate in apical third, with the border obliquely truncate at apex on suture, without sutural denticle. Suture narrowly bordered. Sides not expanded, narrowly bordered. Dorsal surface moderately convex, with a shallow, longitudinal humeral depression, without carinae in both sexes.

*Ventral surface and legs.* Normal.

*Male genitalia.* As shown in Figures 70 and 71; median lobe prolonged into an acute point.

*Remarks.* Specimens in the Schaeffer collection in USNM are the types (holotype ♂, allotype ♀ and 3 paratypes) of *Aulacoscelis ventralis*. One specimen in MCZ with label "Type 8449" of *Aulacoscelis femorata*. One specimen in MCZ with label "Type 8447" of *Aulacoscelis fulvipes*.

The identity of *A. femorata* with *A. fulvipes* has been established by comparing the types of both and by study of a series of intergrading specimens. *A. femorata* is based on a pale colored ♂ with sparse pronotal punctures and pilosity; *A. fulvipes* on a brown ♀ with dense pronotal punctures and pilosity, but no real structural differences have been discovered between the specimens with these two types of sculpture, and they intergrade in series from the same localities. As for *A. ventralis*, its identity with *A. femorata* has been pointed out by Crowson, and the study of the types confirms it.

## B. subgenus JANBECHYNEA s. str.

### Key for the separation of the species (based on ♀♀)

1. Elytra with three longitudinal discal costae. Orange; elytra brownish. Metacoxae normally shaped . . . . . *elongata*
- Elytra with two transverse discal tubercles. Brick-reddish, elytra more or less metallic bluish . . . . . 2
2. Metacoxa prolonged into a triangular plate which reaches end of

third abdominal sternite . . . . . *paradoxa*  
 Metacoxa shorter, prolonged into an oblong, stout projection not  
 longer than first abdominal sternite . . . . . *inversosimilis*

### 3. JANBECHYNEA (S. STR.) ELONGATA (Jacoby)

(Figures 58, 72, 75 to 78)

*Aulacoscelis clongata*, Jacoby, 1888, p. 5, pl. 35, f. 5; Crowson, 1946, p. 88. Mexico. Playa Vicente (Jacoby); San Luis de Potosí: Tamazunchale (2♂, 1♀ allotype May 20, 1952 intercepted at Laredo, Texas, feeding on Cycads, in USNM collection).

*Sexual dimorphism* strong

*Measurements.* ♂ 16 x 4.3 mm.; ♀ (allotype) 16.2 x 4.4 mm.

*Form.* Distinct in both sexes. Color pale orange; elytra pale brown, yellowish at suture and lateral margin; antennae (except basal segments), tibiae, tarsi and apices of femora black; elytral pilosity pale.

*Punctuation.* Cephalic punctuation moderately dense and deep; pronotum almost without punctures; scutellum and elytra with punctures hidden under pilosity.

*Microsculpture.* Elytra minutely shagreened in both sexes.

*Pilosity.* Head and pronotum glabrous and shining, except for some bristles on basal margin of pronotum. Scutellum and elytra with long, dense, decumbent pilosity, sparser on disc in ♀.

*Male.* Head as described for subfamily, nearly as broad as pronotum. Antennae two thirds as long as the body, with intermediate segments rather elongate. Pronotum as long as wide, with maximum width at middle. Sides distinctly sinuate in basal half. Basal margin with a rather deep, small groove on each side. Elytra narrowed in apical third, somewhat dehiscent at apex, which is rounded, practically without irregularities, except for the somewhat expanded sutural and lateral margins. Abdomen less than one quarter shorter than elytra, its last segment with a rather deep but narrow, angular incision. Mesotibiae somewhat curved. Basal segments of tarsi I and II broadened. Median lobe of genitalia very long and slender, prolonged into a median elongate hook curved dorsally, in which no median suture is visible.

*Female* (allotype). Head distinctly narrower than pronotum. Antennae about one half length of body. Pronotum widest before

middle. Basal grooves not as deep as in ♂. Elytra longer than in ♂, very acute towards apex, and with a long, dehiscant, acute external angle. Disc with three distinct, longitudinal, subparallel costae, the outer one limiting the lateral declivity, the inner one shortest. Abdomen shortened; about one third shorter than elytra; its last segment with a short, obtuse, apical, angular projection. Mesotibiae almost straight. Tarsi not broadened.

*Remarks.* Although Jacoby mentions the existence of a longitudinal pronotal groove, none of the specimens studied has it.

4. JANBECHYNEA (S. STR.) INVEROSIMILIS n. sp.

(Figures 59, 61, 62, 73, 79)

Peru. Chanchamayo (1 holotype ♀ #29237 in col. Bowditch MCZ).

*Measurements.* ♀ holotype 16 x 5.8 mm.

*Form.* Elongate and acuminate at apex. Color brick-red; elytra blue-greenish, with moderate metallic shine. Antennae (except basal segments), hind legs, tibiae, tarsi, and apices of femora of other legs black. Scutellum paler than pronotum. Elytral pilosity black.

*Punctuation.* As in *J. elongata*.

*Microsculpture.* Elytra minutely shagreened.

*Pilosity.* As in *J. elongata* but elytral hairs finer and shorter.

*Head.* Similar to that of *J. elongata* ♀ but more elongate and with mandibles more projecting.

*Pronotum.* About as long as wide, widest slightly before middle. Sides moderately rounded, not sinuate at base. Basal grooves not so deep as in *J. elongata*.

*Scutellum.* Very distinctly transverse, broader and more rectangular than in *J. elongata*.

*Elytra.* Of same general form as in ♀ of preceding species, but more elongate. Disc with 2 transverse tubercles, the anterior one larger and higher.

*Legs.* As in ♀ of *J. elongata*. Metacoxae swollen, their posterior margins extended in irregular curves.

*Abdomen.* Very short; first segment with a longitudinal, excavated, pubescent tract.

*Remarks.* A very large, strange-looking species, easy to recognize.

5. JANBECHYNEA (S. STR.) PARADOXA MONRÓS  
(Figures 60, 74)

Monrós, 1953, p. 21, figs. 1-8.

Bolivia. Santa Cruz (1 ♀ holotype, 2 ♀ paratypes in Museum Frey, München; 2 ♀ paratypes in col. Monrós, *ex* Frey).

Brazil. Chapada (1 ♀ CM; 1 ♀ col. Monrós *ex* CM).

This species so closely resembles *J. inverosimilis*, that only the differences need to be pointed out.

Size somewhat smaller (13 to 14 mm. x 5 mm.); coloration same but somewhat paler and elytra duller and more violaceous, with extreme base orange reddish in the specimens from Chapada. All femora with basal halves orange-reddish. Pronotal grooves shallower than in *J. inverosimilis*. Elytral pilosity finer; elytral tubercles less raised. Metacoxae extended as triangular plates of which the lateral margins reach the posterior edge of the third ventral segment. Those plates are flat and finely pubescent ventrally.

*Remarks.* This species could be confused with the preceding one, but is easily distinguished by the very peculiar shape of the metacoxal plates.

### SUMMARY

1. The history, characters, systematic position and geographic distribution of the Subfamily Aulacoscelinae are described and the relationships with the other Chrysomelidae are discussed.
2. Host plants for some species, and some observations on the habits of *Aulacoscelis candezei* Chap., are reported for the first time.
3. Some remarks on the probable phylogeny, variability and significance of the group are added.
5. Keys for the genera, subgenera and species are given, and all the species redescribed.
6. *Aulacoscelis melanocera* is credited to Duponchel and Chevrolat, 1842, and not to Stål, 1865 as is usually done.
7. The male genitalia of several species are described and illustrated for the first time, and so is the pilosity and sculpture of the dorsal surface. The habitus of most of the species is figured from typical material.

8. The genus *Janbechynea* Monrós is redescribed and its limits broadened.
9. *Bothroscelis* (type *Aulacoscelis femorata* Jac.) is described as a new subgenus of *Janbechynea*.
10. New distributions: *Aulacoscelis melanocera* Dup. & Chevr. for British Honduras and Nicaragua; *A. tibialis* Jac. for British Honduras; *Janbechynea paradoxa* Monrós, for Brazil.
11. New combinations: *Aulacoscelis melyroides* Crowson and *A. fulvipes* Jac. are transferred to *Janbechynea* (*Bothroscelis*); and *Aulacoscelis clongata* Jac., to *Janbechynea s. str.*
12. New species: *Aulacoscelis confusa* and *Janbechynea (s. str.) inverosimilis*.
13. New synonyms: *Aulacoscelis candezei* Chap. (= *A. purpurea* Horn); *Janbechynea (Bothroscelis) fulvipes* (Jac.) (= *Aulacoscelis femorata* Jac.).  
The identity of *Janbechynea fulvipes* (Jac.) and *Aulacoscelis ventralis* Schaeffer is confirmed by type examination.
14. Allotypes described: ♂ of *Aulacoscelis tibialis* Jac., ♀ of *Janbechynea clongata* (Jac.).
15. A bibliographical list intended to cover the whole subfamily is appended.

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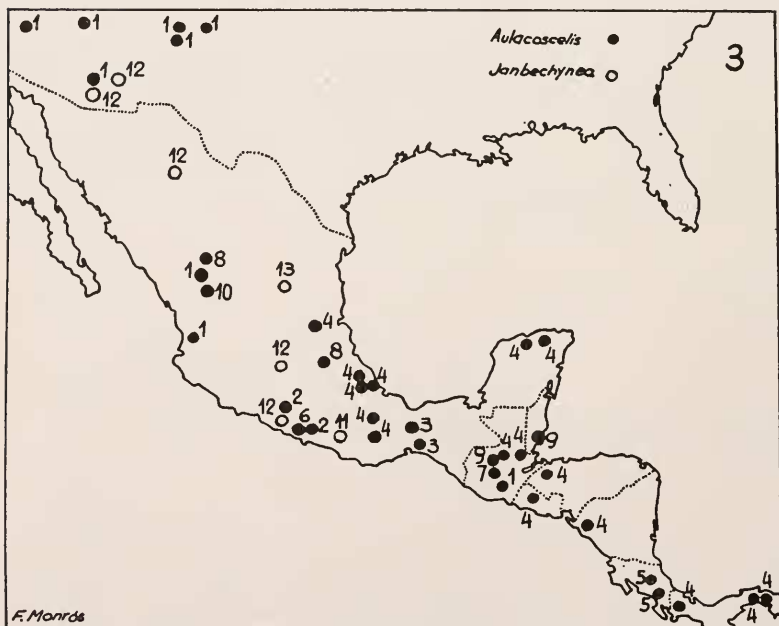
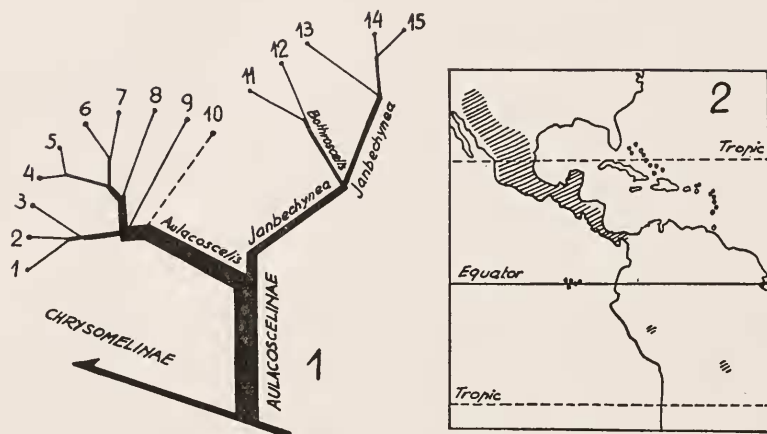
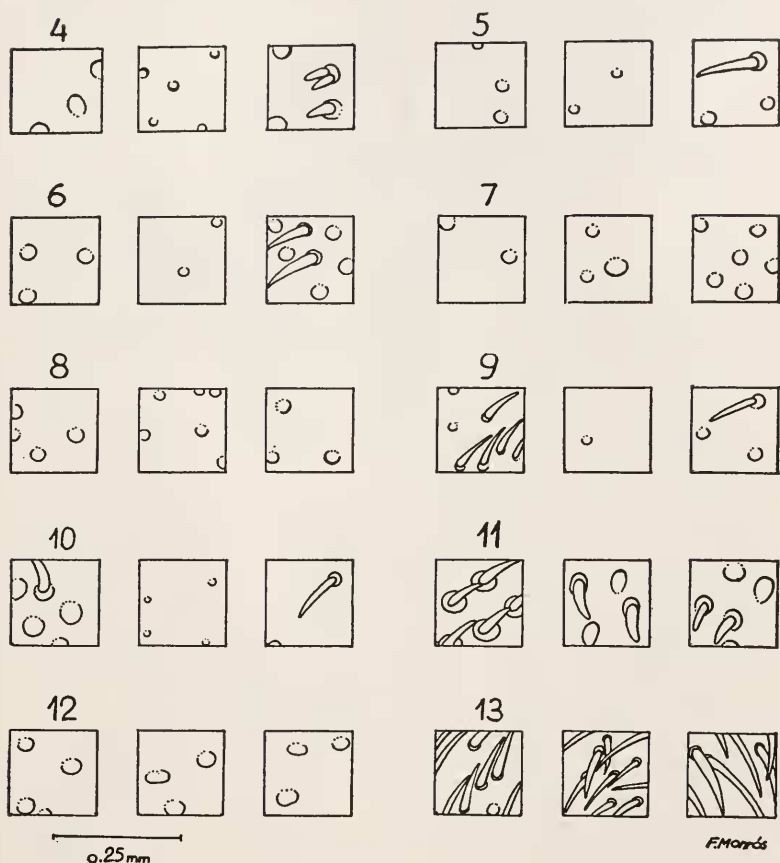


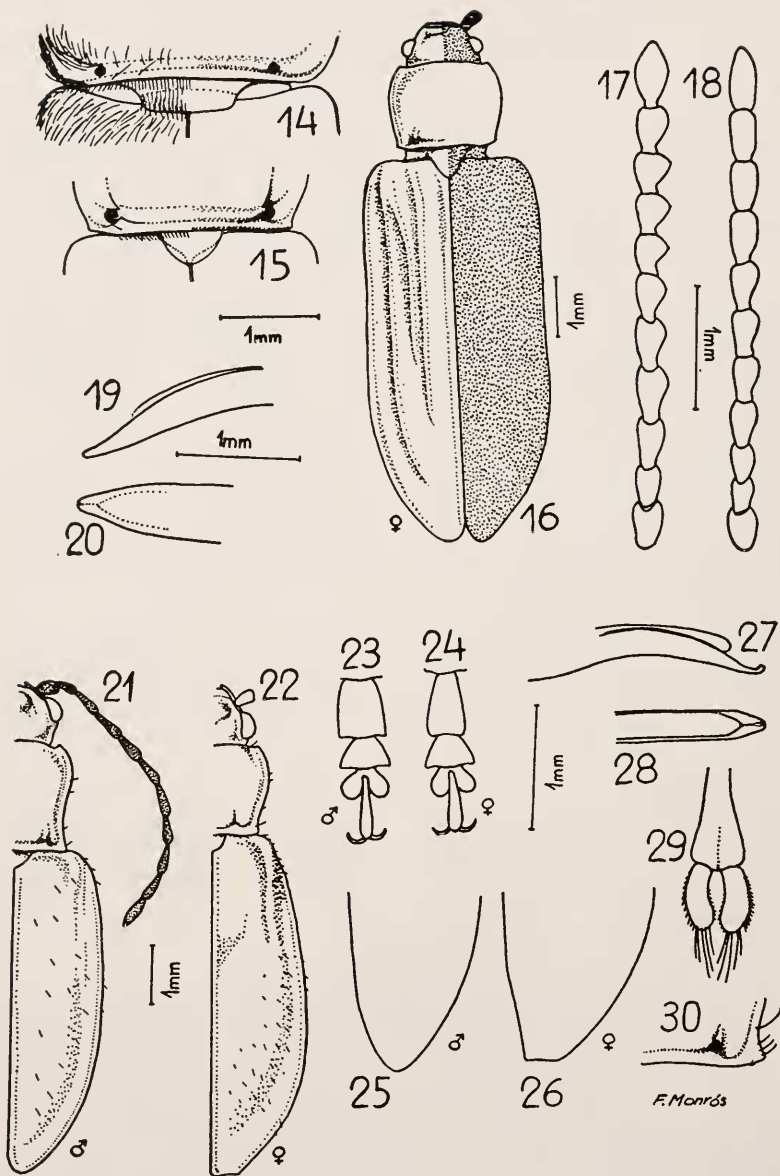
Fig. 1. Phylogenetic relationship of Aulacoscelinae: 1. *Aulacoscelis candezei* Chap.; 2. *A. högei* Jac.; 3. *A. confusa* n. sp.; 4. *A. melanocera* Dup. & Chev.; 5. *A. costaricensis* Bech.; 6. *A. sanguinea* Jac.; 7. *A. melanocephala* Jac.; 8. *A. variabilis* Jac.; 9. *A. tibialis* Jac.; 10. *A. grandis* Jac.; 11. *Janbechynea* (*Bothrosceles*) *melyroides* (Crowson); 12. *J. (B.) fulvipes* (Jac.); 13. *J. (s. str.) elongata* (Jac.); 14. *J. (s. str.) inverosimilis* n. sp.; 15. *J. (s. str.) paradoxa* Monrós.

Fig. 2. General distribution of Aulacoscelinae.

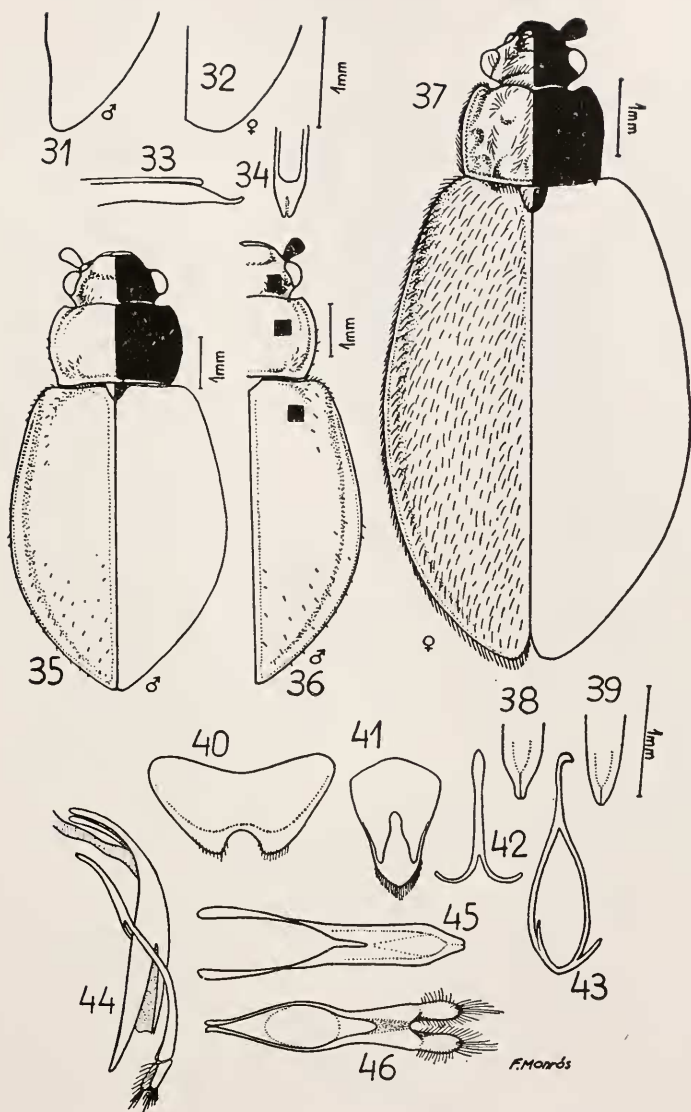
Fig. 3. Distribution of the Central American species of Aulacoscelinae; numbers as in Figure 1.



Figs. 4-13. Dorsal punctures and pilosity in *Aulacoscelis*. In each case the left square is taken from the head, the central square from the prothorax, and the right square from the elytra; the places indicated by the squares are represented in Figure 36. The microsculpture is not indicated in the figures. 4. *A. candezei* Chap.; 5. *A. högei* Jac. 6. *A. confusa* n. sp.; 7. *A. melanocera* Dup. & Chev.; 8. *A. costaricensis* Bech.; 9. *A. sanguinea* Jac.; 10. *A. melanocephala* Jac.; 11. *A. variabilis* Jac.; 12. *A. tibialis* Jac.; 13. *A. grandis* Jac.

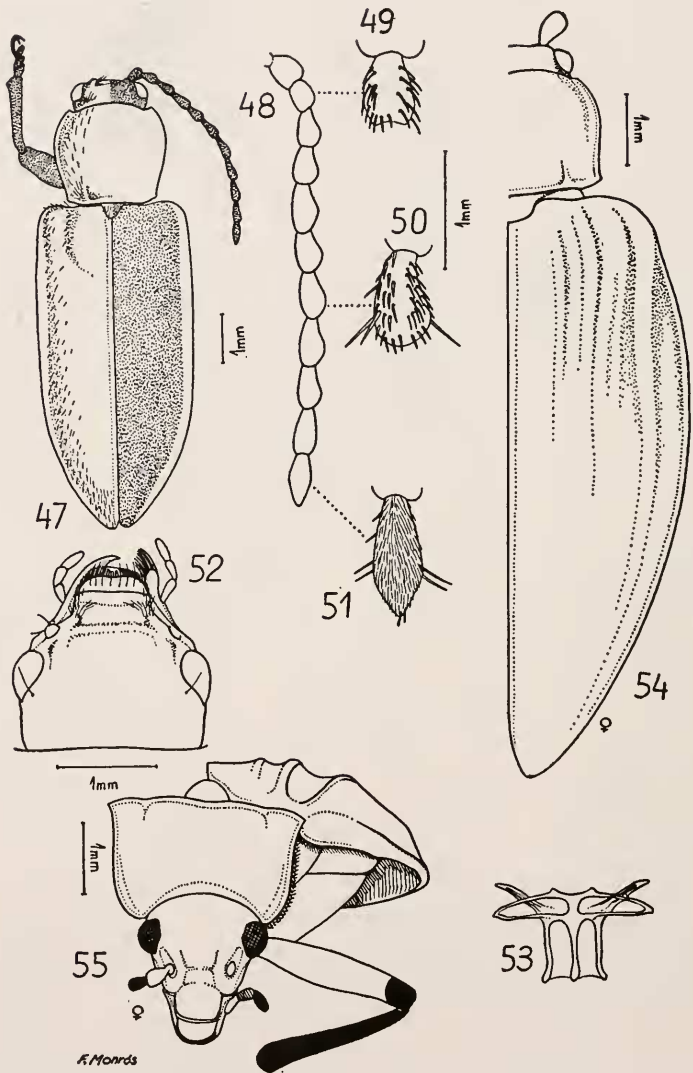


Figs 14-30. 14. Base of prothorax, scutellum and base of elytra in *Janbechynea (Bothroscelis) fulvipes* (Jac.). The pilosity indicated on the left side, only the structure on the right side. 15. Same in *Aulacoscelis melanocera* Dup. & Chev. 16. *Aulacoscelis candezei* Chap. The specimen illustrated is a paratype of *A. purpurea* Horn in PAS; structure indicated on left side, color on right side. 17. Antenna of *A. högei* Jac. cotype ♂ (pilosity not indicated). 18. Same of *A. confusa* n. sp. holotype ♂. 19. Male genitalia of *A. högei* Jac.; apex of median lobe from the side. 20. Same from below. 21. *Aulacoscelis costaricensis* Bech. ♂ topotype in USNM. 22. Same, ♀. 23. Same, anterior tarsi of ♂. 24. Same, of ♀. 25. Same, apex of elytron of ♂. 26. Same, of ♀. 27. Same, ♂ genitalia, from the side. 28. Same, from above. 29. Same, median dorsal process of tegmen from above. 30. Same, posterior prothoracic angle showing basal fold and groove.

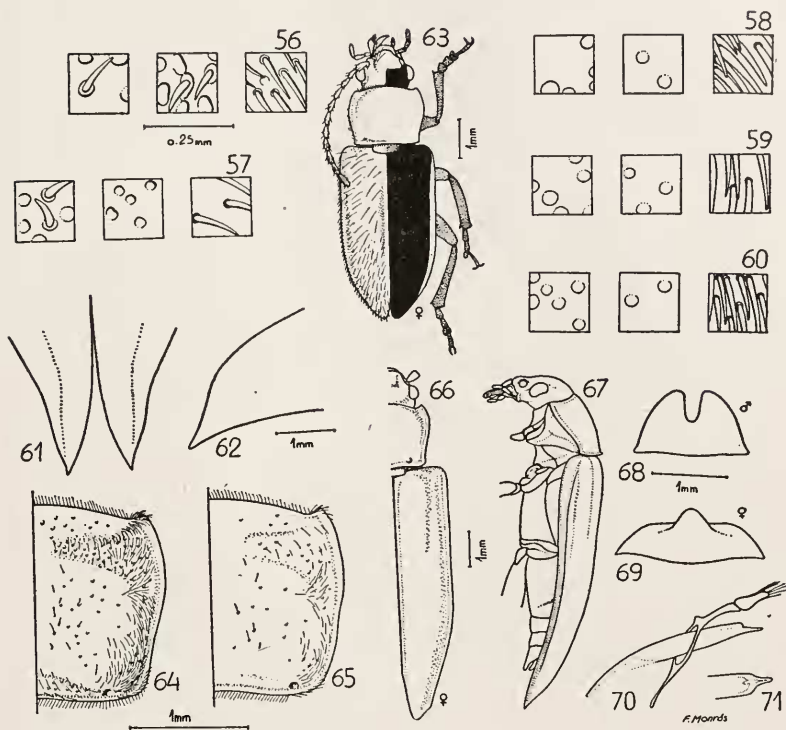


Figs. 31-46. 31. *A. melanocera* Dup. & Chevr.; apex of elytron of ♂. 32. Same, ♀. 33. Same, ♂ genitalia from the side. 34. Same, from above. 35. *A. melanocephala* Jac. holotype ♂ in MCZ; pilosity and structure on left side, colors on right. 36. *A. sanguinea* Jac. cotype ♂ in MCZ; the squares represent the approximate places from which the samples of punctures and pilosity are taken. 37. *A. grandis* Jac. cotype ♀ in MCZ (as fig. 35). 38. *A. melanocephala* Jac. ♂ genitalia. 39. *A. sanguinea* Jac. ♂ genitalia. 40. Last sternite of *A. variabilis* Jac., inner side. 41. *A. variabilis* Jac., first invaginated abdominal sclerite. 42-43. Sclerites appended to genitalia ♂ in *A. variabilis* Jac. 44. *A. variabilis* Jac., ♂ genitalia from the side with tegmen and internal sac in place. 45. *A. variabilis* Jac., median lobe of ♂ genitalia from below. 46. *A. variabilis* Jac., annular tegmen from above.

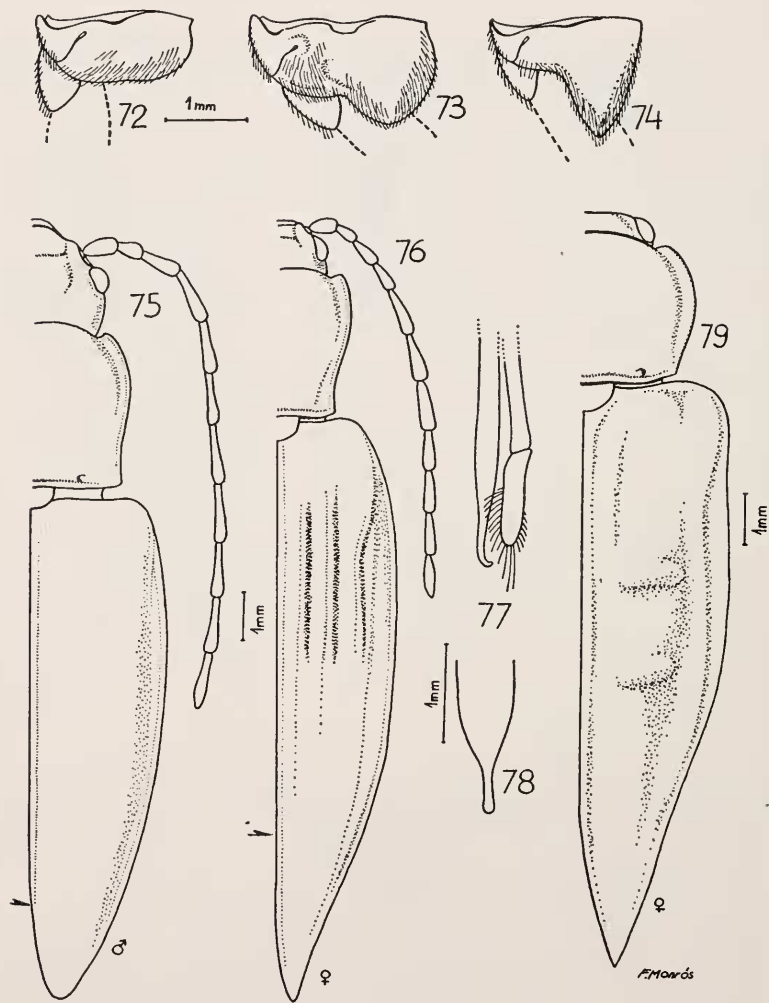
F. MORRIS



Figs. 47-55. 47. *A. variabilis* Jac. ♀ cotype in USNM (as fig. 35). 48. Same, antenna without pilosity. 49-51. Same, type of antennal pilosity. 52. Same, head of ♂. 53. Same, metendosternite. 54. *A. tibialis* Jac. cotype ♀ in MCZ. 55. Same from front with indication of colors.



Figs. 56-71. 56-60. Dorsal punctures and pilosity in *Janbechynea*. As figs. 4-13. 56. *J. (Bothroscelis) fulvipes* (Jac.); 57. *J. (B.) melyroides* (Crowson); 58. *J. (J.) elongata* (Jac.); 59. *J. (J.) inverosimilis* n. sp. 60. *J. (J.) paradoxa* Monrós. 61. *J. inverosimilis* n. sp. apices of elytra. 62. Same, from the side. 63. *J. (B.) melyroides* (Crowson) paratype ♀ in col. Monrós; as fig. 35. 64. *J. (B.) fulvipes* (Jac.), pronotal punctures and pilosity in cotype ♂. 65. Same as shown in cotype ♂ of *Aulacoscelis femorata* in MCZ. 66. *J. (B.) fulvipes* (Jac.). The specimen illustrated is a paratype ♀ of *Aulacoscelis ventralis* Schaeffer in USNM. 67. Same, from the side. 68. Same, last sternite in ♂. 69. Same in ♀. 70. Same, ♂ genitalia from the side. 71. Same, apex of median lobe from below.



Figs. 72-79. 72-74. Metacoxae ♀ from the inner side in *Janbechynea s. str.*; position of femur indicated by dotted lines. 72. *J. (J.) elongata* (Jac.). 73. *J. (J.) inverosimilis* n. sp. 74. *J. (J.) paradoxa* Monrós. 75. *Janbechynea (s. str.) elongata* (Jac.); the arrow indicates length of abdomen. 76. Same, allotype ♀ in USNM. 77. Same, genitalia ♂ from the side. 78. Same from above. 79. *J. (J.) inverosimilis* n. sp. holotype ♀ in MCZ (colors and pilosity not indicated).